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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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35195	7590	02/24/2006	EXAMINER	
FERENCE & ASSOCIATES 409 BROAD STREET PITTSBURGH, PA 15143			SHORTLEDGE, THOMAS E	
			ART UNIT	PAPER NUMBER
			2654	
DATE MAILED: 02/24/2006				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/737,259

Applicant(s)

LUO ET AL

Examiner

Thomas E. Shortledge

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 December 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6-16 and 18-25 is/are rejected.
- 7) ☒ Claim(s) 5, 17 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This communication is in response to Remarks filed 12/07/2005.
2. Claims 1-25 are pending. Claims 1, 13 and 25 are independent. Claims 1, 13 and 25 have been amended.
3. The 35 U.S.C. 101 non-statutory rejection of claims 1, 13 and 25 has been withdrawn in accordance with the applicants' amendments.

Response to Arguments

4. Applicant's arguments, in regards to claims 1-4, 6-16, and 18-25, filed 12/07/2005 have been fully considered but they are not persuasive.

As to claims 1, 13 and 25 the applicants argues that Richardson et al. (5,752,052) do not teach, "adapting a statistical model via employing a mathematical transform." The applicants argue that, "normalizing the statistics for the rules and lexicon entries (Fig. 1, element 103), where it would be necessary for the normalizing step to be carried out by a mathematical transform," does not teach the invention as claimed. The applicant further states, "the first striking and fundamental difference between the cited reference and the present invention is the central use of "rule and lexicon" in Richardson. There is simply no rule in the statistical parsers on which this invention was developed." The examiner argues that by the fact that Richardson et al.

teach normalizing the statistics within a statistical parser, and since any operation performed on a series of statistics would be mathematical in nature, Richardson et al. teach a mathematical transform used for adapting a statistical model. Further, given the broadest interpretation, a mathematical transform can include any mathematical operation performed on the statistical model including those performed by updating the statistical model by calculating new rules or normalizing rules to update the statistical model within the parser.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., the mathematical transform used in the present invention is not an arbitrary mathematical operation, but rather it must maintain the consistency of a probability distribution, i.e. there is a probability distribution before and after transform) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in

the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Richardson et al. and Kita et al. both teach parsing using statistical methods, and Kita et al. further teach using Hidden Markov models within the parsing process. Further, motivation to combine can found in Kita et al., where a goal of Kita et al. is to be able to further improve recognition accuracy (page703, left column).

The applicants' argue (page 11, para. 3) that the present invention does not use nor claim to use HMMs. Therefore, Kita et al. do not teach or suggest these claims and their rejection should be withdrawn. The examiner argues that the Markov Transform recited within the claims is exemplified but not defined within the specification', therefore, the examiner is giving the term its broadest reasonable interpretation, and based on this interpretation, the teachings of Kita et al. are applicable.

As to claims 8, 11, 20 and 23, the applicants' argue that (page 12, paragraph 1), while Richardson addresses decoding test material it fails to teach or suggest decoding for the purpose of adapting an existing parser to new data and/or decoding within a method or process comprising constructing an initial parser and then applying the proposed adaptation technique. However, the examiner argues that Richardson et al. teach compiling statistics indicating the success rate of the parser when it applies each lexicon entry and each rule while parsing a "corpus" or large sample of representative text, and an efficient parsing mode, where the parser only applies applicable rules and

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lexicon entries, where each of these steps are used in compiling new statistical rules for the parser, and used in updating the statistical rule set of the parser.

Applicant's arguments, with respect to claims 5 and 17 have been fully considered and are persuasive. The 35 USC 103 rejection of claims 5 and 17 has been withdrawn.

Claim Objections

5. Claims 5 and 17 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1, 13, and 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Richardson et al. (5,752,052).

As to claims 1, 13 and 25, Richardson et al. teach:

providing a statistical parser, the statistical parser including a statistical model which decodes at least one type of input (parse the input string collecting statistics on rules and lexicon entry success rates, Fig. 1, element 101);

adapting the statistical model via employing a mathematical transform (normalizing the statistics for the rules and lexicon entries, (Fig. 1, element 103), where it would be necessary for the normalizing step to be carried out by a mathematical transform, and it is further taught that ratio are calculated and stored for the number of times the rule or lexicon entry produces a record in a parse tree is applied, col. 7, lines 10-15. Moreover, it is taught that the facility continues to update the statistics within the parser, (col. 8, lines 6-10), where it would be necessary that any operation performed on a statistical model would be mathematical in nature.).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 2, 6-12, 14, and 18-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Richardson et al. in view of Kita et al. (HMM Continuous Speech Recognition Using Predictive LR Parsing).

As to claim 2 and 14 Richardson et al. do not teach the mathematical transform employed by said adapter comprises a Markov Transform.

However Kita et al. do teach updating probabilities using a Hidden Markov Model phone probability calculation process (page 704, right column).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the parsing system of Richardson et al. with the Markov calculations as taught by Kita et al. to further improve recognition accuracy as taught by Kita et al. (page 703, left column).

As to claims 6 and 18, Richardson et al. do not teach that the adapter is configured for choosing a Markov matrix such that the log probability of given material is maximized.

However, Kita et al. do teach of finding the highest and best probability (page 704, right column).

Therefore it would have been obvious for one of ordinary skill in the art at the time of the invention to combine the parsing system of Richardson et al. with the highest probability of Kita et al. to improve recognition accuracy as taught by Kita et al. (page 703, left column).

As to claims 7, 9 and 19, 21, Richardson et al. do not explicitly teach unsupervised or supervised adaptation.

However, Kita et al. teach the use of Viterbi algorithm to update the probabilities, it can be run in either supervised or unsupervised modes (page 704, right column).

Therefore it would have been obvious for one of ordinary skill in the art at the time of the invention to combine the parsing system of Richardson et al. with the unsupervised or supervised updating of Kita et al. to improve recognition accuracy as taught by Kita et al. (page 703, left column).

As to claims 8 and 20, Richardson et al. employing decoded parses of test material (compiling statistics indicating the success rate of the parser when it applies each lexicon entry and each rule while parsing a "corpus" or large sample of representative text, col. 4, lines 19-23).

As to claims 10 and 22 Richardson et al. teach adapting the statistical model comprises employing adaptation material (an efficient parsing mode, where the parser only applies applicable rules and lexicon entries, col. 4, lines 30-34).

As to claims 11 and 23 Richardson et al. teach a statistical model which decodes linguistic input (generating syntax trees to represent the organization of plain-text sentences).

As to claims 12 and 24 Richardson et al. do not teach a statistical model which decodes speech input in speech recognition.

However, Kita et al. teach a speech recognition device for input into the parser, (page 705, right column).

Therefore it would have been obvious for one of ordinary skill in the art at the time of the invention to combine the parsing system of Richardson et al. with the unsupervised or supervised updating of Kita et al. to improve recognition accuracy as taught by Kita et al. (page 703, left column).

10. Claim 3, 4, 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Richardson et al. in view of Kita et al. as applied to claims 2 and 14 above, and further in view of Miller et al. (A Fully Statistical Approach To Natural Language Interfaces).

As to claim 3 and 15 Richardson et al. and Kita et al. do not teach assigning to the statistical model, prior to said adapting step, a probability mass function.

However, Miller et al. teach the statistical model is assigned, prior to adaptation, a probability mass function (the probability mass for each discourse-dependent meaning is focused on a single parse tree, page 56, right column).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the parsing system of Richardson et al. with the Markov

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calculations as taught by Kita et al. and with the probability mass functions of Miller et al. to create an end-to-end system that maps input utterances into meaning representation frames as taught by Miller et al. (page 55, col. 1).

As to claims 4 and 16, Richardson et al. do not teach the probability mass function is written as a row vector.

However, Kita et al. do teach a vector probability array (page 704, right column), equivalent to a row vector:

Therefore it would have been obvious to one of ordinary skill of the art at the time of the invention to combine the parsing system of Richardson et al. with the probability function usage of Kita et al. to conveniently arrange the probability data for updating by Kita's Markov transform.

Allowable Subject Matter

11. The following is a statement of reasons for the indication of allowable subject matter: as to claims 5 and 17 the closest prior art of record (Richardson et al.) do not teach nor fairly suggest, in view of claims 4 and 14, the step of adapting the statistical model comprises right-multiplying the row vector by a Markov matrix.

Conclusion

12. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas E. Shortledge whose telephone number is (571)272-7612. The examiner can normally be reached on M-F 8:00 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on (571)272-7602. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TS
2/16/06



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